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Infall through the Black Hole Horizon, Outflows from Naked Singularities

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We performed the first simulations of accretion onto the compact objects in the Reissner-Nordström (RN) space-time. The results could not be more different for the two cases. For a black hole, just as in the familiar Kerr case, matter overflowing the cusp plunges into the black hole horizon. For the naked singularity, the accreting matter forms an inner structure of toroidal topology and leaves the system via powerful outflows. The results obtained in general relativity are representative of those for spherically symmetric naked singularities and black holes in a number of modified gravity theories.

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